

LISTING OF CLAIMS

1. (Currently Amended) A nanostructure sensor for sensing a target species, comprising:
a device having n-type FET characteristics, said device comprising:
 - at least one molecular nanostructure, the nanostructure comprising at least one carbon nanotube;
 - at least two conducting elements in electrical communication with the at least one nanostructure so as to define a conduction path including the at least one nanotube;
 - a gate electrode disposed and configured to apply a selectable voltage, wherein application of a selectable voltage ~~so as to~~ electrically influences a conductivity of the at least one nanotube; and
 - a polymer ~~functionalization~~ layer adsorbed on the at least one nanostructure, wherein the adsorbed layer ~~composed and configured to~~ alters the electrical properties of the at least one nanotube from p-type to n-type ~~n-type to p-type~~ response to application of a gate voltage, ~~so as to permit sensing the target species by a sensing signal including current flowing through the conduction path under the influence of at least one selected gate voltage during exposure to the target species; and~~
 - ~~passivation material covering at least regions in which there is electrical communication between the at least two conduction~~ conducting ~~elements and the at least one nanostructure.~~
2. (Original) The nanostructure sensor of Claim 1, wherein the at least one nanostructure is selected from the group consisting of nanotubes, nanowires, nanofibers, and nanorods.
3. (Original) The nanostructure sensor of Claim 1, wherein the at least one nanostructure comprises a single-wall carbon nanotube.
4. (Original) The nanostructure sensor of Claim 1, wherein the at least two conducting elements comprise metal electrodes.
5. (Original) The nanostructure sensor of Claim 1, wherein the at least two conducting elements are in direct physical contact with the at least one nanostructure.

6. (Original) The nanostructure sensor of Claim 1, wherein the polymer layer is selected to interact with the target species.
7. (Original) The nanostructure sensor of Claim 1, wherein the polymer layer on the at least one nanostructure is discontinuous.
8. (Original) The nanostructure sensor of Claim 1, wherein the polymer layer comprises more than one material.
9. (Previously Presented) The nanostructure sensor of Claim 1, wherein the target species comprises ammonia and the polymer layer comprises polyethylimine.
10. (Previously Presented) The nanostructure sensor of Claim 1, wherein the particular species comprises hydrogen and comprises polyethylimine.
- 11-18. (Canceled)
19. (Previously Presented) The nanostructure sensor of Claim 1, wherein the at least one molecular nanostructure comprises one or more structures selected from the group consisting of nanotubes, nanorods, nanofibers or nanowires.
20. (Currently amended) The nanostructure sensor of Claim 1, wherein the polymer ~~functionalization~~ layer comprises a material providing an increase in response of the sensor to at least the target species.
21. (Currently amended) The nanostructure sensor of Claim 1, wherein the conduction path includes a plurality of carbon nanotubes, ~~and wherein the sensing signal includes conduction under the influence of a plurality or range of gate voltages.~~
22. (New) The nanostructure sensor of claim 1 wherein passivation material covering at least regions in which there is electrical communication between the at least two conducting elements and the at least one nanostructure.

23. (New) The nanostructure sensor of claim 1 wherein the polymer layer is less than 10 nm thick.
24. (New) A nanostructure sensor for sensing ammonia target species, comprising:
an n-type carbon nanotube field effect transistor, comprising:
at least one molecular nanostructure, the nanostructure comprising at least one carbon nanotube;
at least two conducting elements in electrical communication with the at least one nanostructure so as to define a conduction path including the at least one nanotube;
a gate electrode disposed and configured to apply a selectable voltage, wherein application of a selectable voltage electrically influences a conductivity of the at least one nanotube; and
a polymer layer comprising polyethylimine adsorbed on the at least one nanostructure, said polymer layer configured to interact with the ammonia target species.
25. (New) A nanostructure sensor for sensing hydrogen target species, comprising:
an n-type carbon nanotube field effect transistor, comprising:
at least one molecular nanostructure, the nanostructure comprising at least one carbon nanotube;
at least two conducting elements in electrical communication with the at least one nanostructure so as to define a conduction path including the at least one nanotube;
a gate electrode disposed and configured to apply a selectable voltage, wherein application of a selectable voltage electrically influences a conductivity of the at least one nanotube; and
a polymer layer comprising polyethylimine adsorbed on the at least one nanostructure, said polymer layer configured to interact with the hydrogen target species.